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ROBERT J. DEPKE LEWIS T. STEADMAN ROCKEY, DEPKE & LYONS, LLC SUITE 5450 SEARS TOWER CHICAGO, IL 60606-6306			EXAMINER NGUYEN, LUONG TRUNG	
			ART UNIT 2622	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/517,222

**Applicant(s)**

TOYAMA, TAKAYUKI

**Examiner**

LUONG T. NGUYEN

**Art Unit**

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Species I, illustrated in Figure 1, sub Species 1 illustrated in Figure 2 and Sub Species A illustrated in Figures 10A-B read on claims 1-31 in the reply filed on 7/15/2008 is acknowledged.

### ***Response to Arguments***

2. Applicant's arguments filed on 5/26/2009 have been fully considered but they are not persuasive. However, since claims 5, 7-13, 17, 21, 25 have not addressed in art rejection in previous office action, this action made non-final.

In re page 15, Applicant argues that the cited references do not indicate or suggest a structure or method wherein charge is transferred to the electric charge detection unit at a different vertical transfer time as now specified.

In response, regarding claim 1, Applicant amended claim 1 with limitation "wherein signal electric-charge obtained by a photo-conductive unit at a same row position transferred by the corresponding column electric-charge transfer units for an electric-charge detection unit reaches said corresponding electric-charge detection unit at a different vertical transfer time." The Examiner considers that claim 1 as amended still does not distinguish from Morimoto. Morimoto discloses signal charge obtained by photodiodes 101-1 at a same row of a partial image sensing area 101a share the same shared output section 103a at a different vertical transfer time. Since the signal charge obtained by photodiodes 101-1 at a same row of a partial image

sensing area 101a sequentially readout and amplified at the same shared output section 103a, the signal charge reach the shared output section 103a at different time by inherency in order to allow the solid state image sensing device operate properly, see figure 3.

In re page 15, Applicant argues that independent claim 2 has been modified to specifically require that: a number of stages of electric-charge transfer is different with respect to each of said column electric-charge transfer units associated with a corresponding electric-charge detection unit. In contrast with the invention as specified in modified claim 2, the cited references only indicate that the number of stages of electric-charge transfer is the same for each of the column electric charge transfer units that are associated with a corresponding electric-charge detection unit.

In response, regarding claim 2, Applicant amended claim 2 with limitation “wherein a number of stages of electric-charge transfer is different with respect to each of said column electric-charge transfer units associated with a corresponding electric-charge detection unit.” The Examiner considers that claim 2 as amended still does not distinguish from Morimoto. Morimoto discloses signal electric charge transferred via the dummy vertical transfer sections 104b, 104c and 104d, which has a corresponding number of stages of 2, 4, and 6 (figure 3, column 6, lines 1-34).

***Claim Objections***

3. Claims 1, 5-7, 9, 10, 12, 14, 16, 18, 20, 22, 24, 26-28 are objected to because of the following informalities:

Claim 1 (lines 19-20), claim 6 (lines 18-19), claim 26 (Lines 26-27), “for a electric-charge detection unit” should be changed to --for an electric-charge detection unit--.

Claim 1 (line 21), claim 6 (line 19), “said corresponding electric-charge detection unit” should be changed to --said electric-charge detection unit--.

Claim 5 (line 6), “two adjacent columns” should be changed to --said two adjacent columns--.

Claim 6 (line 3), “photo conductive units” should be changed to --photo-conductive units--.

Claim 7 (line 5), claim 8 (line 5), claim 9 (line 5), “signal electric charge” should be changed to --said signal electric charge--.

Claim 19 (line 3), “a differential detection” should be changed to --a differential detection unit--.

Claims 7, 10, 14, 18, 22 are objected as being dependent on claim 1.

Claims 9, 12, 16, 20, 24 are objected as being dependent on claim 6.

Claims 27-28 are objected as being dependent on claim 26.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-26, 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Morimoto (US 5,969,759).

Regarding claim 1, Morimoto discloses a solid state image sensor comprising:

a plurality of photo-conductive units (plurality of photodiodes 101-1, figure 3, column 5, lines 10-22) which are arranged in rows and columns;

a plurality of column electric-charge transfer units (vertical CCD registers 101-3, figure 3, column 5, lines 10-22) which transfer signal electric-charge in a column direction; and

an electric-charge detection unit (output sections 103a to 103d, figure 3, column 5, lines 10-22) which is provided in correspondence with a plurality of adjacent column electric charge transfer units and which converts signal electric-charge transferred by each corresponding column electric-charge transfer unit into a pixel signal;

wherein signal electric-charge obtained by a photo-conductive unit at a same row position transferred by the corresponding column electric-charge transfer units for an electric-charge detection unit reaches said corresponding electric-charge detection unit at a different vertical transfer time (Morimoto discloses signal charge obtained by photodiodes 101-1 at a same row of a partial image sensing area 101a share the same shared output section 103a at a different vertical transfer time. Since the signal charge obtained by photodiodes 101-1 at a same row of a partial

image sensing area 101a sequentially readout and amplified at the same shared output section 103a, the signal charge reach the shared output section 103a at different time by inherency in order to allow the solid state image sensing device operate properly, figure 3).

Regarding claims 2, 5, Morimoto discloses a solid state image sensor comprising:

a plurality of photo conductive units (plurality of photodiodes 101-1, figure 3, column 5, lines 10-22) which are arranged in rows and columns;

a plurality of column electric-charge transfer units (vertical CCD registers 101-3, figure 3, column 5, lines 10-22) which transfer signal electric-charge in a column direction;

an electric-charge detection unit (output sections 103a to 103d, figure 3, column 5, lines 10-22) which is provided in correspondence with a plurality of adjacent column electric-charge transfer units and which converts signal electric-charge transferred by each column electric-charge transfer unit into a pixel signal; and

wherein a number of stages of electric-charge transfer is different with respect to each of said column electric-charge transfer units associated with a corresponding electric-charge detection unit (Morimoto discloses signal electric charge transferred via the dummy vertical transfer sections 104b, 104c and 104d, which has a corresponding number of stages of 2, 4, and 6 (figure 3, column 6, lines 1-34).

Regarding claim 3, Morimoto discloses wherein in the electric-charge transfer units of said plurality of adjacent columns, an electrode used for the vertical transfer drive is used in common (vertical transfer electrodes, figure 2A, column 2, lines 1-30).

Regarding claim 4, Morimoto discloses wherein said electric-charge detection unit is provided for every two said adjacent columns (each output section 1031, 103b, 103c, 103d is provided for two adjacent columns, Figure 3).

Regarding claim 6, all the limitations of claim 6 are contained in claim 1, therefore, see Examiner's comments regarding claim 1.

Regarding claims 7, 8, 9, Morimoto discloses a selective gate (output gate electrode 18, figure 2A, column 2, lines 1-31).

Regarding claims 10, 11, 12, Morimoto discloses a wiring to a selective gate is shared (a wiring to output gate electrode 18 is inherently included in figure 2A, column 2, lines 1-31).

Regarding claim 13, all the limitations are contained in claim 1, therefore, see Examiner's comments regarding claim 1, except for the limitation "a selective gate," which is disclosed in Morimoto as output gate electrode 18, figure 2A, column 2, lines 1-31.



Regarding claims 14, 15, 16, 17, Morimoto discloses each of said electric-charge detection units includes a reset gate (reset gate electrode 20, figure 2A, column 2, lines 1-31).

Regarding claims 18, 19, 20, 21, Morimoto discloses a differential detection unit (amplifier 23, figure 2A, column 2, lines 1-31).

Regarding claims 22, 23, 24, 25, Morimoto discloses:

a horizontal scanning unit (horizontal registers 102a, 102b, 102c, 102d, figure 3) which sequentially selects and outputs said pixel signal that is output from each of said plurality of electric-charge detection units.

Regarding claim 26, all the limitations are contained in claim 1, therefore, see Examiner's comments regarding claim 1.

Regarding claim 28, Morimoto discloses wherein said electric-charge detection unit includes on the input side of said signal electric-charge (figure 2A),

a selective gate (output gate electrode 18, figure 2A, column 2, lines 1-31) for reading out said signal electric-charge, and

a reset gate (reset gate electrode 20, figure 2A, column 2, lines 1-31), and said reset gate is made to turn on when said selective gate is off.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morimoto (US 5,969,759) in view of Nakano et al. (US 6,765,616).

Regarding claims 27 and 30, Morimoto fails to specifically disclose driving said column electric-charge transfer unit is driven by six-phase drive. However, Nakano et al. teaches an electric camera, in which a vertical transfer unit 32 which is driven by six phase pulses V1, V2, V3, V4, V5, V6 (figure 10, column 13, lines 1-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Morimoto by the teaching of Nakano et al. in order to obtain a solid state image sensor which provides increased dynamic range and improved image quality.

***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571)272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID L. OMETZ can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LUONG T NGUYEN/  
Examiner, Art Unit 2622  
08/10/09